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Vol. 9. Part 10. Pp. 165-186. 15th October, 1940.

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World List abbreviation: *Proc. R. ent. Soc. Lond.* (B)

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LONDON:
PUBLISHED BY THE SOCIETY AND
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A DESCRIPTION OF TWO NEW SPECIES OF THE GENUS *ASPIDOPROCTUS* (COCCIDAE, MARGARODIDAE) FROM TROPICAL AFRICA

By W. H. Thorpe, M.A., Ph.D.

(*Dept. of Entomology, Zoological Laboratory, Cambridge.*)

The genus *Aspidoproctus* as now defined is probably restricted to tropical and sub-tropical Africa. At all events this region has already provided seventeen described species and without any doubt a great many more await discovery on the leguminous trees of dense rain forest and open savannah. The two here described are of interest in that they are both hosts of a remarkable genus of parasitic Diptera, namely *Cryptochaetum*. A number of new species of this parasite genus have recently been described from Africa and life-histories of two of them worked out (Thorpe 1940) and it appears not improbable that ultimately every African species of *Aspidoproctus* will be found to have its own peculiar species of *Cryptochaetum* attacking it.

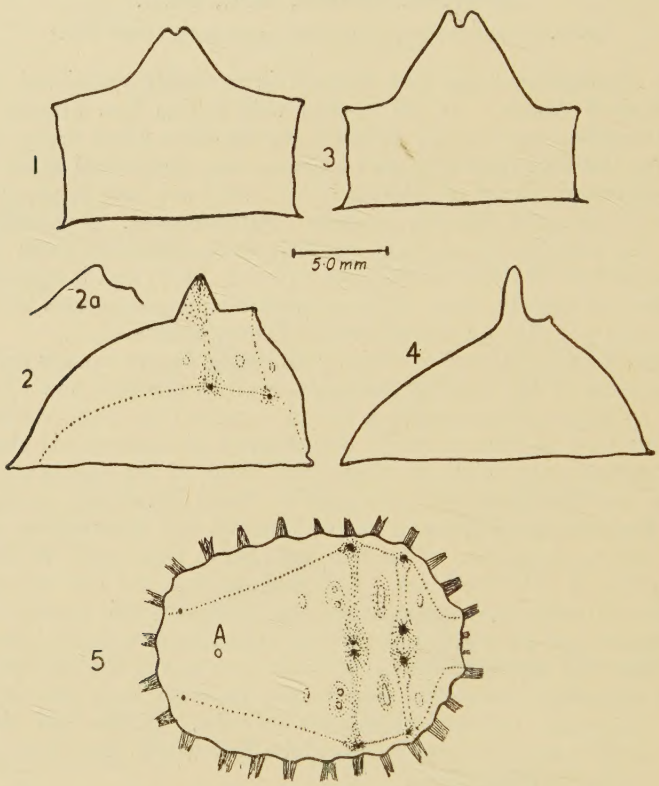
The genus is badly in need of revision and some future worker will no doubt synonymise some of the existing species as well as describe new ones. These insects are so large and so striking in appearance that some earlier workers have been content to rely on rough descriptions of macroscopic characters of the dorsal surface only, with the result that some of the names are well nigh meaningless now that new and intergrading forms have come to light. New characters are always being found in every group and descriptions are always tending to become obsolete. That this will also in time apply to the designations here given is only too clear. But perhaps it is not out of place to put in a plea that future coccid systematists who deal with this group will at least give *some* figures and *some* measurements of appendages and will take the small amount of time and trouble required to make a mount of the skin and examine the dermal characters under the microscope, however large and striking and apparently diagnostic external characters may be. If this had always been attempted in the past, how much time and effort would have been saved and how much confusion eliminated!

These descriptions should by rights have been undertaken by Dr. W. J. Hall of Mazoe, S. Rhodesia, whose knowledge of African Coccidae is unsurpassed. Dr. Hall was unfortunately prevented by other duties from undertaking the work and as the matter was of some urgency I have attempted it myself. I am, however, greatly indebted to the kind advice and sound judgment of Dr. Hall, and his gift of named specimens of many species of the genus has been invaluable. It is a pleasure also to express gratitude to Mr. H. Hargreaves of Uganda and to Dr. Le Pelley and Mr. Melville of the Scott Agricultural Laboratories in Nairobi for the great care and trouble they have taken to secure well-preserved material. The terms employed follow Morrison's fine work on the Margarodidae, to which I am greatly indebted.

Aspidoproctus bifurcatus sp. n.

Adule female (figs. 1–5. Pl. 1, fig. 3). Broadly ovate, strongly convex above, sides almost vertical, deeply and coarsely punctate. *Cephalic* area very ill defined by two

irregular ridges which are absent in some specimens, sloping very steeply downwards, not truncate anteriorly in full-grown specimens. *Thoracic area* convex with two large transverse ridges. The anterior of these bears four small rounded processes; two lateral, marking approximately the forward termination of the longitudinal ridges which form the lateral margin of the abdominal area; and two fairly close together almost in the middle line. The posterior of the transverse ridges bears three small rounded processes; two lateral, similar to those on the anterior transverse ridge, and *one* median which may be



FIGS. 1–5.—*Aspidoproctus bifurcatus*, adult ♀ macroscopic characters. 1, Outline transverse section through mid region of typical Amani specimen (type). 2, Lateral elevation of type. 2a, Apical profile of another Amani specimen to show variation. 3, Outline T.S. of a specimen from S. Rhodesia. 4, Lateral elevation of a S. Rhodesian specimen. 5, Diagrammatic dorsal view. A = anus. Dotted lines represent the course of the main ridges. Black circles represent projections, dotted circles represent depressions.

small and blunt or large and pointed but is *always bifid*. The thoracic area also bears six or more deep pit-like depressions filled with a waxy scurf; these lie in two longitudinal rows on either side of the middle line, the first pair of depressions which are shallower than the others being in front of the first transverse ridge, the second pair between the two ridges and the third pair just behind the posterior ridge. *Abdominal area* with a gradual slope, convex, lateral margin ill defined with *little or no trace of the six blunt processes so characteristic of A. armatus*. Margin beset with twenty-four or twenty-six blunt tooth-like waxen appendages, many of which are bifid; the posterior ones, and the two anterior ones which mark the termination of the cephalic ridges, larger than the rest.

The whole of the dorsum varies from pale yellow-brown in some specimens to deep blackish-brown in others but in life bears a thin scurfy coating of wax. Venter flat or concave, deep reddish-brown. Length (excluding waxy processes) 12–16 mm.; width 8–12 mm.; height 6–10 mm.

Dermal Characters (figs. 6–43).

The dorsal surface of the adult female is sparsely covered with short stout spines (figs. 41–43); these and the thin-walled spines (fig. 40) are more prevalent at the margins. There are numerous pore plates of varying types (figs. 35–39) and there are also a few of the large reticulate pores (compound glands) (fig. 22) which are also found in rows and sparse groups on the ventral surface; they are often deeply invaginated and apparently produce the patches of waxy scurf which are so conspicuous. Contrary to expectations, the anal area does not seem to provide any characters of particular systematic value and the pore plates here are similar in type and arrangement to those on the rest of the dorsum. The ventral surface is densely clothed with stout spines and slender setae (figs. 8, 9, 11, 12) and there is a dense clothing of very long hairs (fig. 10) around the " beak " and between the legs. The lateral marginal cylindrical spines (fig. 13) are very noticeable. The setae and wax glands which cover the lips of the marsupial opening are shown in figs. 24–32 and there are also many examples of No. 11. Other characteristics of the ventral cuticle are shown in figs. 14–23. It will be seen by comparing this account with the descriptions of *A. armatus* given by Vayssière that the two are very close. There is, however, nothing quite corresponding to the curved dorsal spines of *armatus* nor are the slender cylindrical hairs (Vayssière figs. 39, P), stated to be characteristic of *armatus*, to be found. Elements Nos. 33 and 34 also seen to provide fairly good distinguishing characters.

Antennae (fig. 6). The antennal measurements in μ (apart from the basal segment which is difficult to measure accurately) are as follows: 2—108; 3—126; 4—72; 5—72; 6—90; 7—72; 8—83; 9—90; 10—198. This gives an antennal formula on Vayssière's plan as follows: 10, 3, 2, (9, 6), 8, (4, 5, 7, 1).

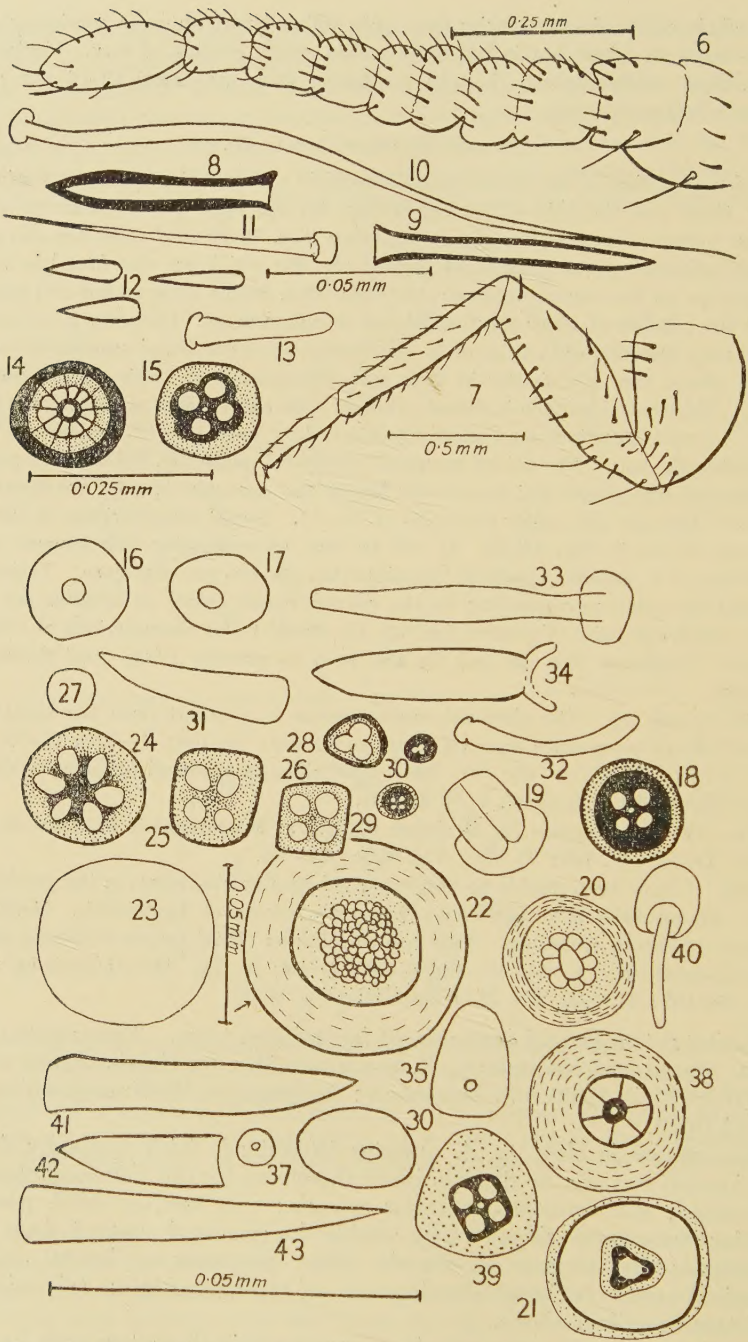
Legs. The metathoracic leg is shown in fig. 7. Measurements in μ are as follows: Cx. 400; Tr. 240; F. 720; Ti. 720; Tar. 400; Claw 64.

Larva. I have been unable to find any good specific characters in the newly hatched larvae. All details seem to agree with Morrison's account of *A. mirabilis*. Measurements are, however, worth recording. They are as follows: Total length 0·74–0·84 mm. Antennal segments (in μ) 1—44; 2—37; 3—33; 4—22; 5—78. Metathoracic leg: Cx. 74; Tr. 74; Fe. 167; Ti. 193; Tar. 211; Claw 41.

Habitat: trunks and branches of leguminous trees. TANGANYIKA TERRITORY: Amani and Kwamkoro, E. Usambara Mts. on *Cassia nodosa* and *Inga vera* (*W.H.T.*, iii.1939). S. RHODESIA: Inyanga, on *Berlinia globifera* (*W. J. Hall*, xi.1938).

This species is close to *A. armatus* (Newstead) (also originally described from Amani) but can be distinguished therefrom by the following characters: (i) rounded, not truncate, anterior margin; (ii) median bifid process on posterior transverse ridge; (iii) double longitudinal row of deep pit-like depressions; (iv) absence of the six blunt processes on lateral margins of abdominal area; (v) weak development of cephalic ridges; (vi) microscopic characters described above.

A. bifurcatus agrees very closely on macroscopic characters with Vayssière's rather incomplete description of the West African *A. bouvieri*; indeed on these characters alone I could not separate it with certainty. However, *A. bouvieri* has much smaller legs and the antennal measurements do not agree at all. Nor do the microscopic characters (as far as described) agree at all well. The



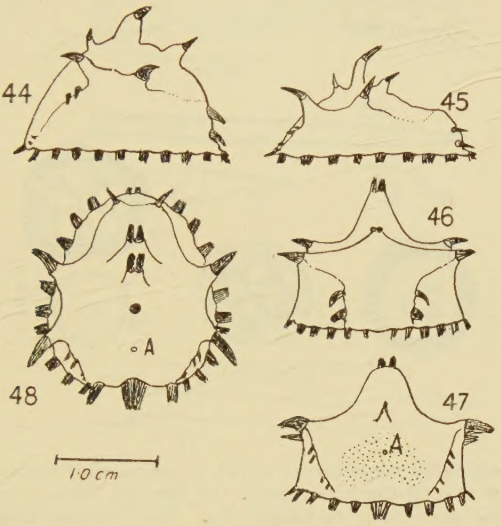
FIGS. 6–43.—*Aspidoproctus bifurcatus*, adult ♀ microscopic characters. 6, Antenna. 7, Metathoracic leg. 8–12, Spines and setae from ventral surface of head and thoracic regions. 13, Lateral marginal cylindrical spine of thorax. 14 and 15, Ventral thoracic disk pores. 16–21, Disk pores of ventral surface of abdominal region. 22, Pore plate of large compound gland. 23, Ventral cicatrix. 24–32, Disk pores and spines from lips of marsupial opening. 33 and 34, Spines from ventral region of abdomen. 35–39, Disk pores from dorsal cuticle. 40–43, Spines and setae from dorsal surface.

type of *A. bouvieri* is in Paris and being inaccessible there is no alternative but to describe my material as new.

Material. Type; Amani, on *Cassia nodosa*. The material from S. Rhodesia tends to smaller size and is somewhat less convex and has the bifid process more strongly developed (figs. 3 and 4). Large numbers of females and larvae available from both areas. Males unknown.

The specific name refers of course to the bifid median dorsal process.

Type specimens have been deposited in the British Museum (Natural History).



FIGS. 44–48.—*Aspidoproctus magnicornis*, adult ♀ macroscopic characters. 44, Side view of fully distended individual. 45, Side view of younger female before ovaries are fully ripe. 46, Front elevation of fully distended individual. 47, Rear elevation ditto. 48, Diagrammatic dorsal view. A = anus.

Aspidoproctus magnicornis sp. n.

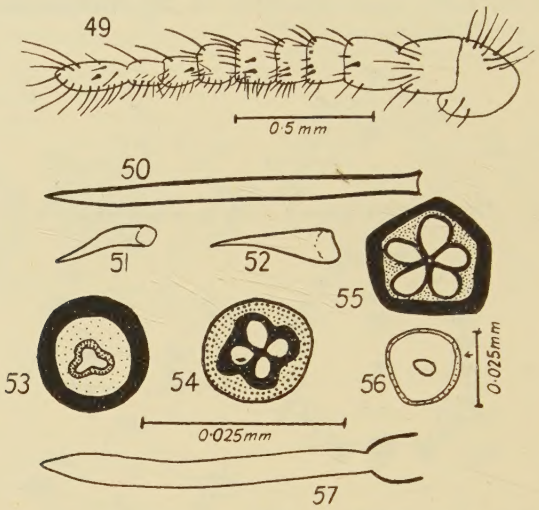
Adult female (figs. 44–48. Pl. 1, figs. 1 and 2) broadly ovate, some specimens almost hemispherical, exact shape and size depending largely on the degree of development of the ovaries. Margin beset with twenty-five hard tooth-like waxen processes about 2 mm. long and ivory white in colour; twelve of these make the complete semicircle on each side and the remaining one, which is much broader than the rest, is situated at the posterior end in the middle line. *Cephalic area* flat or concave. The *cephalic ridges* are well developed. They rise almost vertically from the second pair of marginal teeth and themselves bear two waxen teeth similar to those on the margin. From the uppermost of these a somewhat ill-defined longitudinal fold or ridge runs backward on either side, the two diverging in the middle region and approaching again posteriorly where they descend to the margin about 7 mm. apart. Each of these ridges bears (in addition to the two teeth on the cephalic ridge mentioned above) a series of six waxen teeth. The first two are very large and hard and arise from very stout and conspicuous horn-like outgrowths of the ridge; the remaining four are very small, about 1 mm. long, and are situated on the posterior section of the ridge. In the *mid-dorsal line* is a series of three horn-like processes, the first large and bearing a bifid recurved waxen tooth, the second still larger and with a similar recurved tooth, the third small and conical. The dorsum is chestnut-brown in colour but this is obscured over large areas by a thick granular covering of wax greenish-

white in colour. Venter flat, bright chestnut in colour, anterior part to some extent obscured by wax.

Measurements of well-grown females with well-developed ovaries are as follows :—

Length (excluding wax processes) 18–20 mm. *Breadth* 15–18 mm.

Height 10–15 mm. In the young females with ovaries only partly developed the size may be considerably less, and the degree of distention of the ovaries and the marsupium causes great variation in the relative proportions.



FIGS. 49–57.—*Aspidoproctus magnicornis*, adult ♀ microscopic characters. 49, Antenna. 50–52, Spines of ventral thoracic region. 53 and 54, Disk pores of ventral thoracic region. 55, Disk pore from marsupial lip. 56, Marginal disk pore. 57, Lateral marginal seta or spine.

Dermal Characters (figs. 49–57).

The dorsal surface of the adult female is densely and evenly covered with short stout spines (fig. 50) with a few smaller ones (figs. 51–52) noticeable here and there, particularly in certain areas. The type of spine illustrated in fig. 57 is the nearest approach to the "lateral marginal cylindrical spines" so characteristic of *A. bifurcatus* and is found almost exclusively on the marginal areas. Occasional examples of setae similar to those shown in fig. 11 for *bifurcatus* are also present. The dorsal surface is also richly provided with "pore plates" but they are almost entirely quadrilocular, of the type shown in fig. 54. Around the anus are many modified trilocular pores (fig. 53). Large compound glands with reticulate pore plates similar to those in *bifurcatus* are also present but are much more irregular in shape and size, some being very large. The ventral surface is also densely covered with spines similar to those on the dorsal surface and thoracic sterna; there is the same dense clothing of long setae found in *bifurcatus*.

A. magnicornis does, however, differ markedly from *bifurcatus* in the much greater uniformity of setae, spines and pore plates. Quadrilocular pores (fig. 54) are very abundant and trilocular pores less frequent. Pores corresponding to figs. 18, 19, 20 and 23 are also present but *not* those pores and spines equivalent to figs. 16, 17, 33 and 34. On the margins are to be seen pore plates of the type shown in figs. 25 and 26. The marsupial lip bears some "5-locular" pores and also others corresponding to those of *bifurcatus* (figs. 27–30) but the rather swollen thin-walled processes and the short stout spines (see figs. 31 and 32) of *bifurcatus* are lacking.

Antennae. Measurements in μ are as follows: 1—161; 2—194; 3—178; 4—129;

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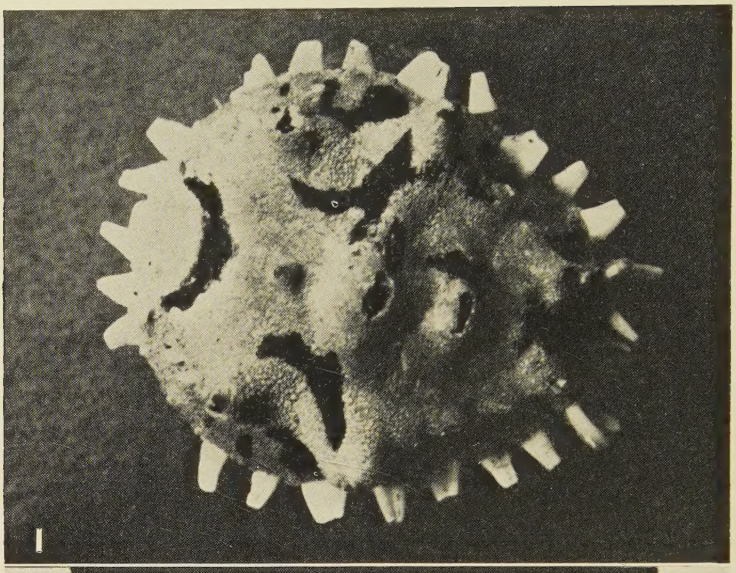

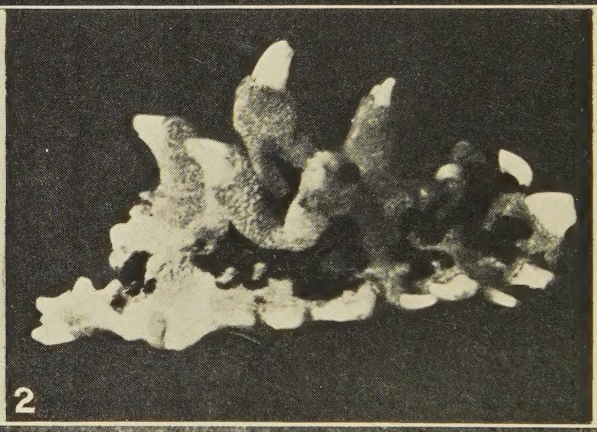

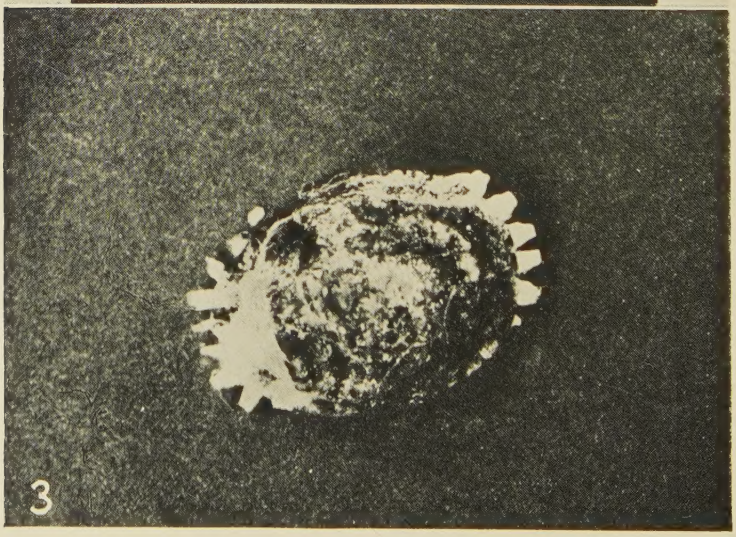

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W. H. Thorpe. **Aspidoproctus** *from Africa.*

5—129; 6—129; 7—145; 8—145; 9—129; 10—274. Formula 10, 2, 3, 1, (7, 8), (4, 5, 6, 9). The arrangement of the antennal setae is different from that in *bifurcatus* and it may perhaps provide useful specific characters. Details are shown in fig. 49; particularly noteworthy are the short and rather stout setae on segments 3, 4, 5, 6 and 8.

Legs. No noteworthy structural characters. Measurements of metathoracic leg in μ as follows: Cx. 806; Tr. 490; Fe. 968; Ti. 1290; Ta. 490; Cl. 210.

Larva. Total length 0·88 mm.–0·97 mm.

Metathoracic leg in μ: Cx. 35; Tr. 67; Fe. 204; Ti. 222; Ta. 148; Cl. 44.

Antenna 1—52; 2—37; 3—33; 4—22; 5—104.

Habitat. Trunks and branches of leguminous trees *Cassia siamea, Pithecolobium saman* and *Albizzia stipulata* at Uganda: Entebbe (*H. Hargreaves*, iii.–v.1939). The patches of greenish-white waxy secretion on a chestnut ground give the insect an extraordinary resemblance to a rugose lichen.

Aspidoproctus magnicornis is apparently nearly related to *A. congolensis* Vayssière from the Belgian Congo. Of this latter species the type is the only specimen known and this is at present screened from observation by its location in the Congo Museum at Tervueren. The description mentions only the macroscopic characters of the dorsum, and the only figure consists of a quite valueless photograph in which not even macroscopic characters can be distinguished. However, in spite of these difficulties it is clear that *magnicornis* can at least be distinguished by the presence of three dorsal protuberances instead of two, and still more by the great discrepancy in size between teeth 1–2 and 4–6 on the lateral ridges. These are apparently uniform in *congolensis*.

Parasites.

This species is heavily parasitised by a species of *Cryptochaetum* which I have not had the opportunity of rearing. From a careful study of the larvae and puparia there seems little doubt that this represents a new species very closely related to *C. striatum* Thorpe, which parasitises *A. maximus* in Tanganyika Territory. There are also many specimens of a hymenopterous parasite, possibly *Pachyneuron* sp.

Material. Ten females and many larvae collected by Mr. Hargreaves. Males unknown. Type specimens have been deposited in the British Museum (Natural History).

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Morrison, H., 1928, A classification of the Higher Groups and Genera of the Coccid Family Margarodidae. *U.S. Dept. Agric. Tech. Bull.* **52**: 239. Washington, D.C.

Thorpe, W. H., 1940, A description of Six New Species of the Genus *Cryptochaetum* (Diptera–Agromyzidae) from E. Africa and E. Indies together with a Key to the Adults and Larvae of all known species. *Parasitology* (in the press).

—— 1940*a*, The Biology of *Cryptochaetum* (Diptera) and *Eupelmus* (Hymenoptera); New Parasites of *Aspidoproctus* (Coccidae) in E. Africa. *Parasitology* (in the press).

Vayssière, P., 1914, Trois Nouvelles Monophlébines [Hem. Coccidae] dans la collection du Muséum National d'Histoire Naturelle. *Bull. Soc. ent. Fr.* **1914**: 333–336.

—— 1926, Contribution à l'Etude Biologique et Systématique des Coccidae. *Ann. Epiphyties* **12**: 197–382.

Plate 1.

Fig. 1. *A. magnicornis* dorsal view.
2. *A. magnicornis* side view.
3. *A. bifurcatus* dorsal view. (Photos. by F. Bloy.)

A LIST OF THE ODONATA OF THE ISLANDS OF THE WESTERN MEDITERRANEAN AREA

By J. Cowley, F.R.E.S.

I offer the following list of Odonata so far recorded from the islands of the western Mediterranean area as a summary of present knowledge of the distribution; it will be seen that for many islands there are no records at all, and even some of the islands which do provide records have very few species, a state of affairs almost certainly due to lack of investigation. Crete, the largest and outermost island, has only had 20 species recorded from it, while Lesbos, the next largest island, about a fifth of the area of Crete, and close to Asia Minor, has records of only four species. While a discussion of the faunistic affinities of the Odonata of these islands would be of considerable interest, it has not been attempted here, because the data appear to me to be too insufficient, and also because the Odonata of the mainland of Greece itself are still very little known. Cyprus has been omitted from this list as I am in receipt of material from that island, which I hope to record later.

Every attempt has been made to include all the known records, and I trust that none has been overlooked. It should be understood that some at least of the records are apparently merely copied from author to author, and not explicitly based on fresh material.

Zygoptera.

Platycnemididae.

Platycnemis pennipes pennipes (Pallas, 1771).

Platycnemis pennipes Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 170, 389. Crete.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. Crete.
Platycnemis pennipes var. *albidella* Selys, 1865, *Bull. Acad. Belg.* (2) **16** : 166. Crete.
Platycnemis pennipes Selys, 1886, *Mém. cour. Acad. R. Belg.* **38** (4) : 129. Crete.
Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 45. Crete.
De Joannis, 1916, *Bull. Soc. ent. Fr.* **1916** : 248. Lesbos : Cape Malea-Loutra.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 208. Crete; Rhodes.

Platycnemis pennipes insularis Selys, 1865.

Platycnemis pennipes r. ? *insularis* Selys, 1865, *Bull. Acad. Belg.* (2) **16** : 166. Corfu.
Platycnemis pennipes r. *insularis* Selys, 1886, *Mém. cour. Acad. R. Belg.* **38** (4) : 129. Corfu.
Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 45. Corfu; Syra.
Platycnemis pennipes Bentivoglio, 1929, *Arch. zool. ital.* **13** : 208. Corfu.

COENAGRIIDAE.

Pyrrhosoma nymphula (Sulzer, 1776).

Pyrrhosoma minium Selys, 1876, *Bull. Acad. Belg.* (2) **41** : 1298. CORFU.

Ischnura elegans ebneri Schmidt, 1938.

Agrion elegans Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 191. CRETE.
Agrion elegans var. *minor* Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 282. CRETE.
Agrion elegans Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. CRETE.
Ischnura elegans Selys, 1876, *Bull. Acad. Belg.* (2) **41** : 279. CRETE.
Cecconi, 1895, *Boll. Soc. ent. ital.* **27** : 195. CRETE : Apokorona.
Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 325. CRETE : Herakleion, Knossos.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 209. CRETE.
Ischnura elegans ebneri Schmidt, 1938, *S.B. Akad. Wiss. Wien* (*math.-nat.*) (I) **147** : 142. CRETE.

Ischnura elegans (Van der Linden, 1820), subsp. ?

Ischnura elegans Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 47. CORFU; TINOS.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 209. COS; TINOS.

It is not possible as yet to determine to which of the subspecies of *I. elegans* recently erected by Schmidt (1938, *S.B. Akad. Wiss. Wien* (*math.-nat.*) (I) **147** : 142) these records should be credited; probably either to *I. elegans ebneri* (Crete, Cyprus, Syria, Palestine) or to *I. elegans pontica* (from Neusiedler See and Carinthia through Hungary and the northern Balkans to Caspian Persia).

Ischnura pumilio (Charpentier, 1825).

Ischnura pumilio Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 325. CRETE : Canea, Herakleion.

Ischnura genei (Rambur, 1842).

Ischnura genei McLachlan, 1899, *Ann. Soc. ent. Belg.* **43** : 302. MALTA.

Coenagrion scitulum (Rambur, 1842).

Agrion scitulum Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 218. CRETE.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. CRETE.
Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 47. CRETE.

Ceriagrion tenellum (De Villers, 1789).

Agrion tenellum Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 182. CRETE.
Agrion rubellum Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. CRETE.
Pyrrhosoma ? *tenellum* Selys, 1876, *Bull. Acad. Belg.* (2) **41** : 1296. CRETE.
Pyrrhosoma tenellum Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 48. CRETE.

The validity of the genus *Palaeobasis* Kennedy, 1920, which includes only this species, has been strongly criticised by Schmidt (1938, *S.B. Akad. Wiss. Wien* (*math.-nat.*) (I) **147** : 147); I think that perhaps on the basis of our present knowledge Schmidt is justified in suppressing *Palaeobasis* as a synonym

of *Ceriagrion*. The classification of the Coenagriidae is by no means easy, owing to the paucity of morphological characters, and as our knowledge of the family progresses the boundaries of many genera are becoming less clear; the whole family is in need of considerable revision which will take into account more and newer characters (as yet undetected) than the few which are at present used.

Lestidae.

Lestes barbarus (Fabricius, 1798).

Lestes barbara Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 161. Crete.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. Crete.
Cecconi, 1895, *Boll. Soc. ent. ital.* **27** : 195. Crete; Omalò.
Anapetes barbara Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 325. Crete : Canea.
Lestes barbara Bentivoglio, 1929, *Arch. zool. ital.* **13** : 206. Cos; Crete.

Lestes macrostigma (Eversmann, 1836).

Lestes macrostigma Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 42. Corfu; Tinos.
Strobl, 1906, *Mitt. naturw. Ver. Steierm.* **42** : 251. Tinos.

Lestes sponsa (Hansemann, 1823).

? *Lestes nympha* Cecconi, 1895, *Boll. Soc. ent. ital.* **27** : 195. Crete : Canea.
Lestes sponsa Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 325. Crete : Canea.

Cecconi's record of *L. nympha* probably refers to *sponsa* and not to *dryas*, of which *nympha* is a synonym.

Lestes viridis parvidens Artobolevsky, 1929.

Lestes viridis Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 325. Crete : Canea.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 205. Rhodes : Nano.
Lestes viridis parvidens Schmidt, 1938, *S.B. Akad. Wiss. Wien* (*math.-nat.*) (I) **147** : 141. Crete.

The records of Pongrácz almost certainly, and Bentivoglio's very probably, refer to the subspecies *parvidens*.

Sympecma fusca (Van der Linden, 1823).

Sympycna fusca Cecconi, 1895, *Boll. Soc. ent. ital.* **27** : 195. Crete : Apokorona.
Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 325. Crete : Knossos.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 207. Rhodes : Profeta Elia.

Agriidae.

Agrion splendens cretense (Pongrácz, 1911).

Calopteryx splendens var. *cretensis* Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 324. Crete : Herakleion, Knossos.

This form is, from the very brief description, of doubtful validity; I assume, from the lack of any other indication in the description, that it might be referred to the subspecies *xanthostoma*.

Agrion splendens xanthostoma Charpentier, 1825.

Calopteryx splendens, race de Prusse, Selys, 1854, *Mém. Soc. Sci. Liége* **9** : 39. Corfu.

Calopteryx splendens Cecconi, 1895, *Boll. Soc. ent. ital.* **27** : 195. Crete : Canea.

It must remain doubtful whether these two records (and that of *cretense* above) are really referable to *xanthostoma*, since a series of subspecies or races are known from Asia Minor, Caucasia, Syria, etc., and in Cyprus at least there is a form very close to *xanthostoma* but which has both heteromorphic and homoeomorphic females.

Agrion virgo festivum (Brullé, 1832).

Calopteryx virgo, race de la Grèce, Selys, 1854, *Mém. Soc. Sci. Liége* **9** : 43. Corfu.

Calopteryx virgo var. *festiva* Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. Crete.

Anisoptera.

Gomphidae.

Gomphus schneiderii Selys, 1850.

Gomphus vulgatissimus r. *schneiderii* Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 29, 78. Corfu.

Onychogomphus forcipatus (Linnaeus, 1758).

Onychogomphus forcipatus Selys & Hagen, 1858, *Mém. Soc. Sci. Liége* **11** : 300. Corfu.

Aeshnidae.

Boyeria irene (Fonscolombe, 1838).

Aeschna irene Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 133. Crete.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. Crete.

Aeschna (*Amphiaeschna*) *irene* Cecconi, 1895, *Boll. Soc. ent. ital.* **27** : 195. Crete : Kisamo.

Boyeria irene Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 324. Crete : Amari.

Brachytron pratense (Müller, 1764).

Brachytron hafniense De Joannis, 1916, *Bull. Soc. ent. Fr.* **1916** : 248. Lesbos : Cape Malea-Loutra.

Caliaeschna microstigma (Schneider, 1845).

Caliaeschna microstigma Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 37. Corfu.
Martin, 1909, *Cat. Coll. Selys* **19** : 109. Corfu.

LIBELLULIDAE.

Orthetrum albistylum albistylum (Selys, 1848).

Orthetrum albistylum Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 324. CRETE : Canea.

Orthetrum anceps (Schneider, 1845).

Libellula ramburii Selys, 1848, *Rev. Zool.* **1848** : 16. CRETE.
Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 21. CRETE.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. CRETE.
Stein, 1863, *Berlin. ent. Z.* **7** : 412. CRETE.
Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 14. CRETE.

Orthetrum brunneum brunneum (Fonscolombe, 1837).

Orthetrum brunneum Martin, 1895, *Bull. Soc. zool. Fr.* **19** : 136. CRETE.
Libella brunnea Cecconi, 1895, *Boll. Soc. ent. ital.* **27** : 195. CRETE : Kisamo, Visari.
Orthetrum brunneum brunneum Ris, 1909, *Cat. Coll. Selys* **10** : 190. CORFU.
Orthetrum brunneum Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 324. CRETE : Canea.
De Joannis, 1916, *Bull. Soc. ent. Fr.* **1916** : 248. LESBOS : Cape Malea-Loutra.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 200. ASTROPALIA; TILOS.

Orthetrum chrysostigma chrysostigma (Burmeister, 1839).

Libella chrysostigma Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 6. CRETE.
Libellula chrysostigma Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 20, 76. CRETE.

Orthetrum coerulescens (Fabricius, 1798).

Orthetrum coerulescens Ris, 1909, *Cat. Coll. Selys* **10** : 184. CORFU; TINOS.
Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 324. CRETE : Herakleion.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 199. ASTROPALIA; COS; RHODES : Afando, Torras.

Orthetrum taeniolatum (Schneider, 1845).

Libellula taeniolata Schneider, 1845, *Stettin. ent. Ztg* **6** : 111. RHODES.
Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 291. RHODES.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 195. RHODES.
Libella taeniolata Brauer, 1868, *Verh. zool.-bot. Ges. Wien* **18** : 732. RHODES.
Libellula taeniolata Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 18. RHODES.
Orthetrum taeniolatum Ris, 1909, *Cat. Coll. Selys* **10** : 192. RHODES.
Morton, 1924, *Trans. ent. Soc. Lond.* **1924** : 41. RHODES.

Orthetrum trinacria (Selys, 1841).

Orthetrum trinacria Bentivoglio, 1929, *Arch. zool. ital.* **13** : 199. Rhodes : R. Argirò.

Libellula depressa Linnaeus, 1758.

Libellula depressa De Joannis, 1916, *Bull. Soc. ent. Fr.* **1916** : 248. Lesbos : Cape Malea-Loutra.

Libellula fulva Müller, 1764.

Libellula fulva Ris, 1910, *Cat. Coll. Selys* **11** : 256. Corfu.

Diplacodes lefebvrei (Rambur, 1842).

Diplacodes lefebvrei Bentivoglio, 1929, *Arch. zool. ital.* **13** : 201. Rhodes : Afando, Argirò.

Crocothemis erythraea erythraea (Brullé, 1832).

Libellula erythraea Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 282. Crete.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. Crete.
Stein, 1863, *Berlin. ent. Z.* **7** : 412. Naxos.
Crocothemis erythraea Selys, 1887, *Ann. Soc. ent. Belg.* **31** : 22. Rhodes.
Cecconi. 1895, *Boll. Soc. ent. ital.* **27** : 195. Crete : Canea.
McLachlan, 1899, *Ann. Soc. ent. Belg.* **43** : 302. Malta.
Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 324. Crete : Canea.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 201. Astropalia; Crete; Rhodes : Afando.

Sympetrum flaveolum flaveolum (Linnaeus, 1758).

Sympetrum flaveolum Bentivoglio, 1929, *Arch. zool. ital.* **13** : 204. Cos.

Sympetrum fonscolombii (Selys, 1840).

Libellula fonscolombii Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 38. Crete.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. Crete.
Sympetrum fonscolombei Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* 9 : 342. Crete : Canea.
Ris, 1911, *Cat. Coll. Selys* **13** : 638. Corfu; Syra.
Bentivoglio, 1929, *Arch. zool. ital.* **13** : 203. Crete; Yali.

Sympetrum meridionale (Selys, 1841).

Libellula meridionalis Selys, 1850, *Mém. Soc. Sci. Liége* **6** : 282. Crete.
Hagen, 1863, *Wien. ent. Mschr.* **7** : 194. Crete.
Sympetrum meridionale Pongrácz, 1911, *Ann. hist.-nat. Mus. hung.* **9** : 324. Crete : Canea.

Sympetrum sanguineum (Müller, 1764).

Sympetrum sanguineum Bentivoglio, 1929, *Arch. zool. ital.* **13** : 204. Astropalia; Cos.

Sympetrum striolatum striolatum (Charpentier, 1840).

Sympetrum striolatum McLachlan, 1899, *Ann. Soc. ent. Belg.* **43** : 302. Malta. Bentivoglio, 1929, *Arch. zool. ital.* **13** : 202. Cos; Rhodes : Pighes, Profeta Elia; Symi.

Trithemis annulata (Beauvois, 1805).

Trithemis annulata Bentivoglio, 1929, *Arch. zool. ital.* **13** : 205. Astropalia; Rhodes.

Table of Distribution.

	Astropalia (Stampalia)	Corfu	Cos	Crete	Lesbos (Mitylene)	Malta	Naxos	Rhodes	Symi	Syra	Tilos (Episcopi)	Tinos	Yali
Platycnemis pennipes		+		+	+			+		+			
Pyrrhosoma nymphula		+											
Ischnura elegans		+	+	+								+	
pumilio				+									
genei						+							
Coenagrion scitulum				+									
Ceriagrion tenellum				+									
Lestes barbarus			+	+									
macrostigma		+										+	
sponsa				+									
viridis parvidens				+				+					
Sympecma fusca				+				+					
Agrion splendens		+		+									
virgo festivum		+		+									
Gomphus schneideri		+											
Onychogomphus forcipatus		+											
Boyeria irene				+									
Brachytron pratense					+								
Caliaeschna microstigma		+											
Orthetrum albistylum albistylum				+									
anceps				+									
brunneum brunneum	+	+		+	+						+		
chrysostigma chrysostigma				+									
coerulescens	+	+	+	+				+				+	
taeniolatum								+					
trinacria								+					
Libellula depressa					+								
fulva		+											
Diplacodes lefebvrei								+					
Crocothemis erythraea erythraea	+			+		+	+	+					
Sympetrum flaveolum flaveolum			+										
fonscolombii		+		+						+			+
meridionale				+									
sanguineum	+		+										
striolatum striolatum			+			+		+	+				
Trithemis annulata	+							+					
Total number of species	5	13	6	20	4	3	1	10	1	2	1	3	1

CERATOPOGONIDAE (DIPTERA) FROM BRITISH GUIANA AND TRINIDAD. PART 1

By J. W. S. Macfie, M.A., D.Sc., M.B., Ch.B., F.R.E.S.

The collection on which this report is based consists of 114 specimens from British Guiana taken in the neighbourhood of the Mazaruni Settlement on the Mazaruni River and the Kaieteur Fall on the Potaro River by Dr. O. W. Richards of the Imperial College of Science and Dr. John Smart of the British Museum (Natural History), during their joint expedition, in the months of August and September, 1937, and 107 specimens obtained subsequently in Trinidad by Dr. Smart during October of the same year. The types of the new species described are in the British Museum (Natural History), to the Trustees of which I am indebted for the opportunity of examining this material.

Altogether 25 different species (and one *Atrichopogon* not described) are represented in the collection, and of these 14 appear to be new, namely, 3 *Paryphoconus*, 2 *Atrichopogon*, 2 *Stilobezzia*, 1 *Johannsenomyia*, 3 *Bezzia*, and 3 for which I believe a new genus (*Echinohelea*) is required. As is often the case in collections from this region, the majority of the specimens (69 of those from British Guiana, and all those from Trinidad) are *Atrichopogon*, and the separation of them into different species is, as usual, difficult and rather unsatisfactory. None of the insects was taken in the act of biting, and only two of the species procured, namely *Culicoides guttatus* (5 specimens) and *Lasiohelea stylifer* (12 specimens), are known to attack man. It is noteworthy that the collection includes 4 species of *Paryphoconus*.

The method of description is the same as that I used recently in reports on other collections of Ceratopogonidae from British Guiana (1940) and Trinidad (1937). The unit employed is approximately 3·7 μ.

Paryphoconus nigripes Macfie, 1939B.

British Guiana: Mazaruni, 2nd growth (Low Forest), 21.viii.1937, 1 ♀.

Paryphoconus unimaculatus sp. n.

A large, yellowish-brown species with the wings adorned with a dark brown spot covering the cross-vein, but without infuscation either at the tip or in the anal angle.

♀. Length of wing about 6 mm., greatest breadth about 1·6 mm.

Head very dark brown or blackish. Eyes bare. Palpi darkish brown, the third segment sub-cylindrical, without pit; lengths of last three segments about 26, 16, and 20 units respectively. Antennae with torus and basal segments pale, yellowish, and last five darkish brown, with short, simple (not lanceolate) hairs: segments 4–10 sub-cylindrical, sub-equal, about 31–32 by 6–7 units; 11–14 much elongated, sub-cylindrical, about 90–105 by 5–6 units; 15 similar but longer, about 160 by 5 units, without stylet. The combined lengths of segments 3–10, 4–10, and 11–15 about 275, 215, and 550 units respectively. *Thorax* yellowish-brown, with moderately dense pubescence. Anterior margin narrowed, bluntly conical, with an erect, pointed tubercle. Scutellum yellowish-brown. *Wings* with a small dark brown area covering cross-vein, but without infuscation at tip or in anal angle. Anterior veins yellowish-brown, others colourless. No macrotrichia, and no bristles excepting those on costa which are small, numerous, and set closely together.

Microtrichia conspicuous, covering entire wing surface. Tip rather pointed. Fringe normal. Anal angle very obtuse. Costa ending near tip, at nearly same level as end of M1. Radial cell single, not exceptionally narrow, the veins distinctly separated distally. Cross-vein short, about half length of distance separating bases of M1 and M2. Fork of Cu proximal to level of base of M2. Halteres with whitish knobs. *Legs* almost uniformly yellowish-brown, but with 4th segment of all tarsi darker than rest; well clothed with short hairs, and with form of segments normal. Femora not thickened, unarmed. Hind legs not especially long, with row of bulbous hairs on first two segments of tarsi. Tarsi of all legs with 3rd segment short, 4th even smaller and scoop-shaped, and 5th unarmed. T.R. about 2·5. Claws all small, equal, each with a small basal barb on inner side. *Abdomen* darker brown than thorax, with a red tint. Tip (with spermatheca) missing. No gland rods visible in the portion of the abdomen which remains.

British Guiana: Gorge of Potaro, Tukeit, 11.ix.1937, 1 ♀.

This insect differs from the other species of *Paryphoconus* which have the wings adorned in having no infuscated area at the tip.

Paryphoconus guianae sp. n.

A small, blackish, species, with pale brown legs, and unadorned wings.

♀. Length of wing about 2·9 mm., greatest breadth 0·8 mm.

Head blackish. Eyes bare, widely separated above. Palpi small, pale brown, the third segment without pit: lengths of last three segments about 14, 7, and 12 units respectively. Proboscis short, mandibles armed with 5 strong teeth. Antennae almost uniformly darkish brown, the basal segments bearing stiff, lanceolate, hairs: segments 4–10 oval, ranging from about 17 by 9 to 14 by 6 units; 11–14 cylindrical, sub-equal, about 47–48 by 4–5 units; 15 similar but rather longer, about 60 units, without stylet. The combined lengths of segments 3–10, 4–10, and 11–15 about 125, 100, and 250 units respectively. *Thorax* and scutellum very dark brown or blackish. Anterior margin narrowed, bearing a tubercle which is not very sharply pointed. *Wings* unadorned, almost colourless, but with tip faintly infuscated. Veins colourless or very pale. No macrotrichia, and bristles on costa short and rather widely spaced, especially at base. Microtrichia minute, covering whole wing surface. Fringe normal. Tip rounded. Anal angle obtuse. Costa extending about seven-eighths length of wing, its end a little beyond level of end of M2. Radial cell single, with distal two-thirds very narrow or a mere slit. Cross-vein short. Distance between bases of M1 and M2 about same as length of cross-vein. Fork of Cu well proximal to level of base of M2. Halteres with dark brown knobs. *Legs* almost uniformly pale brown, but apical quarter of hind tibiae and terminal segments of tarsi more deeply infuscated; well clothed with short hairs. Knees not dark. Form of segments normal; hind legs not remarkably long. Femora not swollen, unarmed. Tarsi of all legs with 3rd segment short, 4th even shorter and obliquely truncated, and 5th unarmed. T.R. a little over 2. Claws all small, equal, each with a minute barb. *Abdomen* very dark brown or blackish. No gland rods visible. Spermatheca single, collapsed in the unique specimen but probably oval or sub-spherical, and with a diameter of about 50 μ.

British Guiana: Mazaruni, clearing, 13.viii.1937, 1 ♀.

This insect is smaller than *P. grandis* Macfie, and has a shorter costa.

Paryphoconus aemulus sp. n.

A blackish species with unadorned wings, and very dark brown legs.

♂. Length of wing nearly 2 mm., greatest breadth about 0·5 mm.

Head blackish. Eyes bare. Palpi dark brown, the third segment without definite pit: lengths of last three segments about 12, 5, and 10 units respectively. Antennae

with torus and last three segments dark brown, the other segments paler brown. Plume very scanty. Segments 4–11 sub-equal, about 24 by 7–8 units; 12 similar but a little longer, about 27 by 8 units; 13–15 elongate, sub-cylindrical, their lengths about 62, 69, and 103 units respectively, the last without stylet. *Thorax* and scutellum blackish, the former somewhat narrowed anteriorly. Anterior tubercle very small, a minute knob. *Wings* unadorned, brownish, the veins brown or brownish. No macrotrichia, and no bristles excepting those on costa which are spaced rather widely apart. Microtrichia conspicuous, covering whole surface of wing. Fringe normal. Tip rounded. Anal angle obtuse. Costa extending more than seven-eighths length of wing, its distal end almost at same level as end of M2. Radial cell single, not especially narrow at any part, open almost to extremity. Cross-vein short. Distance between bases of M1 and M2 about same as length of cross-vein. Fork of Cu slightly proximal to level of fork of M. Halteres with infuscated knobs. *Legs* very dark brown, but four anterior legs with bases of femora and first 2–3 segments of tarsi paler than rest. Bristles and hairs fairly abundant; some rather long, others (especially a few on first tarsal segment of middle legs) spine-like. Knees all dark. Form of segments normal, hind legs not remarkably long. Femora not swollen, unarmed. Tarsi of all legs with 4th segment bell-shaped, 5th unarmed. Hind legs with usual row of bulbous spines on first two segments of tarsi. T.R. about 2·2. Claws all small, equal. *Abdomen* almost black. Hypopygium (fig. 1) very dark. Ninth segment with sternite slightly excavated in middle line posteriorly; tergite with few large bristles, and hairy processes rather large. Side-pieces of usual form, not long and narrow as in *Macroptilum natalensis*; claspers about as long as side-pieces, with hook-like ends. Harpes in contact or actually united in middle third, each with a highly chitinised root-like base, and a distal portion which is somewhat expanded at the end. Aedeagus shield-shaped, forming a wide arch over ninth sternite, and prolonged distally as a rod-like process. Membrane joining aedeagus to ninth sternite spiculate.

British Guiana: Mazaruni, High Forest, 20.viii.1937, 1 ♂.

This insect resembles in some respects *P. nigripes* Macfie, a species taken in Argentina of which only the female is known, but it is smaller, and lacks the characteristic adornment at the tip of the wing. I have referred it to the genus *Paryphoconus*, but it must be remembered that it may be the male of a species of *Macroptilum*. In this connection it should be pointed out that although it bears a general resemblance to the male *Macroptilum natalensis* de Meillon there are notable differences in the structure of the hypopygium.

Forcipomyia insigniforceps Macfie, 1939A.

British Guiana: Mazaruni, 2nd growth (Low Forest), 14 and 21.viii.1937, 2 ♂♂.

Lasiohelea stylifer (Lutz).

British Guiana: Mazaruni, 2nd growth (Low Forest), 16.viii.1937, 1 ♀, and 21.viii.1937, 10 ♀♀; and Mazaruni River, First Fall, High Bush, 18.viii.1937, 2 ♀♀.

Atrichopogon adamsoni Macfie, 1937.

Trinidad: Blanchisseuse Rd., at summit, 31.x.1937, 1 ♀, "swept, roadside."

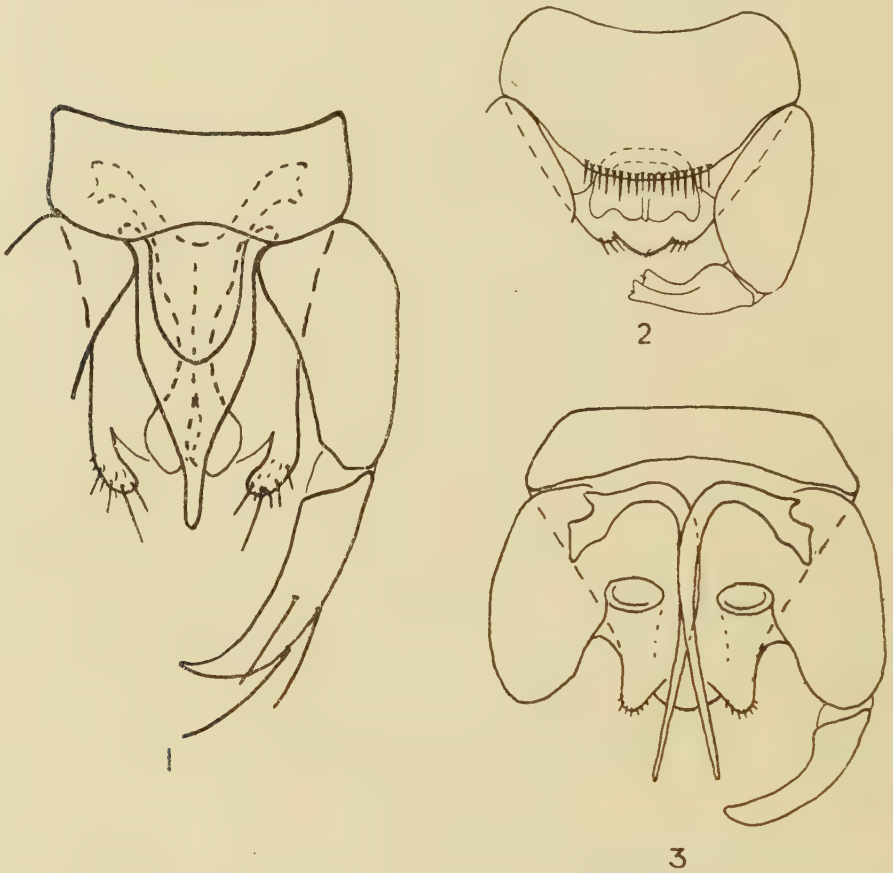
The numerous species of *Atrichopogon* found in the neotropical region cannot be separated without mounting every specimen and examining it in minute detail. This I have not done with all the specimens in this collection, and some of the identifications must therefore be regarded as conjectural. I have, however, supplemented my superficial examination by a more detailed examination of random samples.

Atrichopogon gordoni Macfie, 1938.

British Guiana : Mazaruni, clearing, 11 to 16.viii.1937, 1 ♂, 5 ♀♀; Mazaruni, 2nd growth (Low Forest), 16.viii.1937, 2 ♀♀; and Kaieteur, savannah and environs, 2 to 6.ix.1937, 1 ♂, 12 ♀♀.

Trinidad : Piarco, savannah, 29.x.1937, 2 ♂♂, 3 ♀♀; Blanchisseuse Rd., at summit, 31.x.1937, 2 ♀♀, " swept, roadside "; and Arena Forest Reserve, roadside, 31.x.1937, 13 ♂♂, 10 ♀♀, " swept, roadside."

The hypopygium of the males is similar to that of *A. insigniventris*.



Figs. 1–3.—1, *Paryphoconus aemulus* sp. n., hypopygium, ventral view ; 2, *Atrichopogon* sp. ? *nebulosus* Macfie, hypopygium, ventral view ; 3, *Stilobezzia silvicola* sp. n., hypopygium, ventral view.

Atrichopogon sp. ? *nebulosus* Macfie, 1939A.

Trinidad : Piarco, savannah, 29.x.1937, 2 ♂♂.

These are small, blackish, insects, with the scutellum blackish, the legs yellowish-brown, and a characteristic hypopygium. The wings of both are much folded and torn, but they show traces of adornment similar to that found in the Brazilian species, *A. nebulosus*. Such adornment is an unusual feature,

and although they are smaller these insects may prove to be specimens of the hitherto unknown male of this species. Their chief characters are as follows :—

♂. Length of wing about 0·9 mm. *Head* almost black. Eyes densely hairy in part. Palpi pale brown, third segment with small, deep, pit. Antennae dark brown, torus more yellowish-brown than rest, and plume scanty and very dark : segments 4–10 sub-equal in length but successively narrower, ranging in one specimen from about 11 by 7 to 11 by 4 units; 11 shorter, about 9 by 4 units; 12–15 elongate, their lengths about 13, 21, 21, and 32 units respectively, the last measurement including a slender stylet of about 6 units. *Thorax* and scutellum almost black, the latter bearing the usual 4 bristles. *Wings* much damaged, crumpled and torn, but showing distinct traces of adornment which is apparently similar to that in *A. nebulosus*. No macrotrichia visible, and apparently only one or two bristles on radial veins. Both radial cells narrow. Petiole of M perhaps a little shorter than cross-vein, and fork of Cu well distal to that of M. Halteres with white knobs. *Legs* yellowish-brown, the terminal segments of tarsi somewhat infuscated. T.R. about 2·7. Bristles and hairs, form of segments, claws, and empodium normal. Apical spine on tibiae of hind legs large, yellowish. *Abdomen* blackish, and hypopygium even darker. The hypopygium (fig. 2) is remarkable, highly chitinised and entirely very dark. Ninth segment short and broad, the sternite somewhat produced posteriorly in middle line, bearing numerous ordinary bristles (not shown in diagram), and armed posteriorly with many short, stiff, almost spine-like bristles. Claspers short, characteristic, as shown in figure.

Atrichopogon umbratilis Macfie, 1935.

British Guiana : Mazaruni, 2nd growth (Low Forest), 14 and 16.viii.1937, 1 ♂, 2 ♀♀.

These insects are probably of the same species as those from Brazil for which I (1935) proposed the name *A. umbratilis*. In the female the fork of the wing-vein Cu is almost at the same level as that of M, and there are numerous bristles on the radial veins. In one of the females R2 is missing from both wings. The apical spine on the tibiae of the hind legs is rather small and yellowish-brown, and the distal comb composed of about 10 longer bristles. The male, which has not previously been collected, resembles the female in general characters. The following additional details may be given.

♂. Length of wing nearly 1·4 mm. Eyes apparently bare. Antennae rather dark brown, with ample plume, the lengths of segments 11–15 about 13, 23, 30, 27, and 38 (including stylet of about 5 units) units respectively. Wings without macrotrichia, and with only one or two bristles on radial veins. Fork of Cu at about same level as that of M. T.R. nearly 3. Tibiae of hind legs with apical spine rather small, and distal comb composed of about 8 longer bristles. Hypopygium of usual form, without any very distinctive features. Ninth sternite slightly excavated in middle line posteriorly, bearing 7–8 bristles.

Atrichopogon woodfordi Macfie, 1938.

British Guiana : Mazaruni, clearing, 26.viii.1937, 25 ♂♂, 13 ♀♀, "on fallen fruit under bread-fruit tree."

Trinidad : Piarco, savannah, 29.x.1937, 39 ♂♂, 35 ♀♀.

All these specimens appear to be similar, but a satisfactory identification is not always possible because many of the insects are much damaged. The male, which has not previously been collected, resembles the female in general characters, and has no very notable feature excepting the relative shortness of the first segment of the hind tarsus. As the male has not previously been described the following details about it may be given here.

♂. Antennae very dark, but segments 4–10 and plume paler than rest: segments 4–10 ranging from about 14 by 10 to 14 by 6 units; 11 more elongate, similar to 12, without plume whorl, about 19 by 5 units; 12–14 sub-equal, about 21 by 5 units; 15 longer, about 35 units of which 7 units represent length of stylet. Wings much as in female but without macrotrichia, and with only one or two bristles on radial veins: length about 1 mm. Petiole of M shorter than cross-vein; fork of Cu situated well distal to level of that of M. Legs as in female: T.R. about 1·8. Spine at apex of hind tibiae long, pale. Hypopygium of usual form, without any very characteristic features. Claspers ending in a rather strong, pointed process. Aedeagus much as in *A. eucnemus*.

Atrichopogon nanus sp. n.

A very small, almost black, species with the T.R. about 3; the female with the first one or two basal segments of the antennae slightly broader than long, and the wings with a few macrotrichia at the tip.

♂, ♀. Length of wing nearly 0·9 mm., greatest breadth about 0·3 mm.

Head almost black. Eyes densely hairy; in female broadly contiguous above. Palpi darkish brown, small, third segment inflated, with a relatively large and deep rounded pit: lengths of last three segments in both sexes about 7–9, 6–7, and 6–7 units respectively. Antennae in female uniformly dark brown: segments 4–10 ranging in one specimen from 6 by 7 to 7 by 6 units; 11–14 elongate, sub-equal, about 18–19 units; 15 longer, about 32 units (including stylet of about 5 units). The combined lengths of segments 3–10, 4–10, and 11–15 about 51, 43, and 106 units respectively. In male torus very large and much darker than flagellum segments, plume well developed, not very dark, segments 12–15 more infuscated than basal segments: segments 4–11 ranging in one specimen from 11 by 7 (maximum) to 9 by 4–5 units; 12 slightly longer, about 12 by 4–5 units; 13–15 elongate, lengths about 28, 24, and 35 (including stylet of about 6 units) by 5 units. *Thorax* almost black. Scutellum almost black, bearing in both sexes 4 bristles. *Wings* unadorned but rather dark, the veins dark or darkish brown. Macrotrichia in female scanty, a few near tip in cell R5 and M1, but none elsewhere; in male entirely wanting. Costa in female extending about three-quarters length of wing. Both radial cells open. Bristles on radial veins scanty, in female a scattered few, in male only one or two. Petiole of M in female nearly as long as cross-vein, in male shorter. Fork of Cu well distal to level of that of M. Halteres dark brown, but knobs as usual containing a white substance. *Legs* almost uniformly dull, brown, not yellowish, the knees hardly darker, but terminal segments of tarsi more or less infuscated. T.R. in both sexes about 3, or rather more. Tibiae of hind legs with apical spine small and light coloured, distal comb composed of only about 5 bristles. Bristles and hairs, form of segments, claws, and empodium normal. *Abdomen* very dark brown, blackish, the tip not paler. In female no ventral armature. Spermatheca single, highly chitinised, not large, collapsed in the specimen examined so that shape and dimensions cannot be estimated. Hypopygium dark, of usual form, without any distinctive features.

British Guiana: Mazaruni, High Forest, 27.viii.1937, 1 ♂, 2 ♀♀, "in swarm over still water."

This is a much smaller insect than *A. umbratilis* Macfie, and appears to differ slightly from that species in some other respects, *e.g.* in the antennal and tarsal ratios, and in having the eyes conspicuously hairy.

Atrichopogon guianensis sp. n.

A small, blackish, species with the scutellum almost as dark as the thorax, the antennae entirely blackish and with all the basal segments broader than long, the wings with numerous macrotrichia in the anal cell, and a single spermatheca.

♀. Length of wing about 1·2 mm., greatest breadth 0·4 mm.

Head almost black. Eyes hairy. Palpi dark brown, third segment only slightly inflated about middle, with deep pit, segments 4 and 5 not fused: lengths of last three segments about 15, 8, and 11 units respectively. Antennae (including torus) uniformly blackish: segments 4–10 all broader than long, measuring in one specimen from about 5 by 9 to 6 by 7 units; 11–14 elongate, sub-equal, 23 by 8 units; 15 about 32 (including stylet of about 4 units) by 6 units. The combined lengths of segments 3–10, 4–10, and 11–15 about 47, 39, and 125 units respectively. *Thorax* almost black. Scutellum also almost black, only slightly if at all paler than scutum: bearing 4 bristles and a few small hairs. *Wings* unadorned, the veins brownish. Macrotrichia numerous both at tip and along posterior border (including anal cell), and present along whole lengths of M1, M2, Cu1, and Cu2, with one or two also at end of Cu, and several on anal vein. Anal angle and lobe moderately well developed. Costa extending about three-quarters length of wing. Both radial cells open, but first very narrow; second about two and a half times as long as first. Petiole of M about as long as cross-vein. Fork of Cu at about same level as that of M. Angle formed by branches of Cu less than right angle. Halteres brownish, with infuscated knobs. *Legs* dull brownish or yellowish-brown: knees not dark. T.R. about 2·6. Form of segments, claws, and empodium normal. *Abdomen* very dark brown, blackish when dry. No ventral armature. Spermatheca single, highly chitinised, apparently oval or somewhat pear-shaped and measuring about 80 μ by 60 μ; length of chitinised part of duct about 11 μ.

British Guiana: Kaieteur, savannah and environs, 2.ix.1937, 2 ♀♀.

This insect is smaller than *A. palpalis* Macfie, which also has numerous macrotrichia in the anal cell, a blackish scutellum, and a single spermatheca, and differs from it in having the 4th and 5th segments of the palpi distinct, not fused, and the basal segments of the antennae (4–10) all shorter than broad instead of sub-spherical. It may be distinguished from *A. obfuscatus* I. & M., which has somewhat similar antennae, by the greater area of the wings over which the macrotrichia are distributed. It differs from *A. brasiliensis* Macfie in several details, for example, in having the basal segments of the antennae shorter, in having more numerous macrotrichia in the anal cell, and in having the duct of the spermatheca chitinised at its commencement for a short distance.

Atrichopogon sp.

British Guiana: Mazaruni, High Forest, 27.viii.1937, 2 ♂♂, "in swarm over still water."

These two males are not described because they cannot be associated with any of the known females. They resemble males of *A. umbratilis* in some respects, and have the eyes apparently bare and the scutellum almost black, but differ in having the palpi with fourth segment very small, barely half length of fifth, antennae with segment 13 fully two and a half times as long as 12 (47 to 17 units), wings with fork of Cu slightly more distal than that of M, and tibiae of hind legs with apical spine long, longer than bristles of distal comb, and yellowish-brown. The hypopygium is similar to that of *A. umbratilis*.

Culicoides guttatus (Coq., 1904).

British Guiana: Mazaruni, clearing, 13 to 21.viii.1937, 5 ♀♀.

Dasyhelea thalestris Macfie, 1935.

British Guiana: Mazaruni, clearing, 14.viii.1937, 2 ♀♀.

Stilobezzia silvicola sp. n.

A small brown species with unadorned wings and legs, and a characteristic hypopygium.

♂. Length of wing nearly 0·9 mm., greatest breadth nearly 0·4 mm.

Head dark brown. Eyes bare, separated above. Palpi brown, third segment with shallow pit: lengths of last three segments about 7, 3, and 9 units respectively. Antennae long, about three-quarters length of wing, rather pale brown but with last three segments somewhat darker, with an ample, brown, plume: segments 4–11 successively a little longer, lengths ranging from about 7 to 10 units; 12 similar to 11, length about 10 units, but darker at its end; 13–15 more elongate, sub-cylindrical, lengths about 23, 29, and 37 units respectively, the last without stylet. *Thorax* rather dark brown, without especial adornment. Scutellum apparently destroyed by pinning. *Wings* almost colourless, unadorned, the veins pale brown. Tip broad and rounded. No macrotrichia, and no bristles on radial veins. Microtrichia normal. Fringe normal. Costa extending about two-thirds length of wing. Two radial cells both open: first a narrow slit; second wider, more than four times as long as first. M with petiole long, much longer than cross-vein, forking at about same level as distal end of first radial cell. Fork of Cu at about same level or rather more proximal. Halteres with pale, brownish, knobs. *Legs* rather pale brown, unadorned, but knees a little darker than rest. Hind legs with distal extremity of tibia also slightly darker; 1st tarsal segment without basal spine. T.R. ? (most of hind tarsi missing). Form of segments and claws normal; tarsi with 5th segment unarmed. *Abdomen* almost uniformly darkish brown. Hypopygium (fig. 3) darker. Harpes long, lath-like, rods which project backwards, and protrude ventrally between the side-pieces. Aedeagus not clearly distinguished: apparently entirely membranous. On inner aspect near posterior third the chitinised parts form a pair of rounded structures unlike anything I have observed in other species.

British Guiana: Mazaruni, High Forest, 27.viii.1937, 1 ♂, "in swarm over still water."

Stilobezzia dryadum sp. n.

A small, dull yellowish-brown species with unadorned wings without macrotrichia, with almost uniformly brown legs, and with a single spermatheca.

♀. Length of wing about 1·3 mm., greatest breadth 0·4–0·5 mm.

Head rather dark yellowish-brown. Eyes bare, separated above. Palpi darkish brown, third segment sub-cylindrical, without definite pit: lengths of last three segments about 13, 6, and 13 units respectively. Antennae almost uniformly darkish brown: segments 4–10 sub-cylindrical, ranging from about 14 by 5 to 19 by 3–4 units; 11–14 elongate, sub-equal, length 25–30 units; 15 longer, about 50 units, without stylet. The combined lengths of segments 3–10, 4–10, and 11–15 about 130, 110, and 160 units respectively. *Thorax* darkish yellow-brown: bristles and hairs scanty, but with a group of about 6 small bristles above root of each wing. No anterior tubercle. Scutellum paler than scutum, more yellowish: bearing 4 bristles but no small hairs. *Wings* unadorned, the veins brownish. Tip rounded. No macrotrichia, or just one or two at tip almost in the fringe; and no bristles on radial veins. Microtrichia and fringe normal. Costa extending about three-quarters length of wing. Two radial cells, both open: first small, lenticular; second much wider, nearly six times as long as first. M with petiole longer than cross-vein, the fork distal to level of end of first radial cell. Fork of Cu at almost same level as cross-vein. Halteres with brownish knobs. *Legs* almost uniformly dull brown: bristles and hairs short, and not especially abundant. Hind legs without a basal spine on first segment of tarsus. T.R. about 2·5. Form of segments and claws normal: tarsi with 5th segment unarmed. *Abdomen* dark brown above, yellowish-brown below. Spermatheca single (but also a rudimentary one), highly chitinised, pitted, collapsed in the unique specimen but probably oval, and about 88 μ by 52 μ: the duct with practically no part chitinised.

British Guiana: Mazaruni, High Forest, 20.viii.1937, 1 ♀.